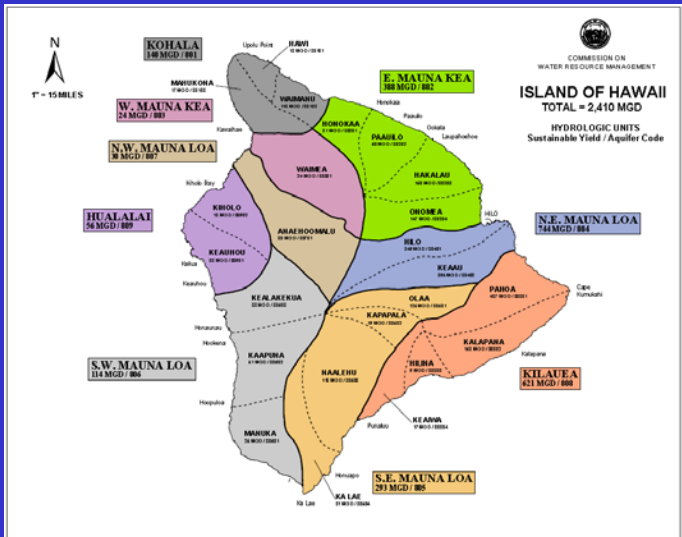
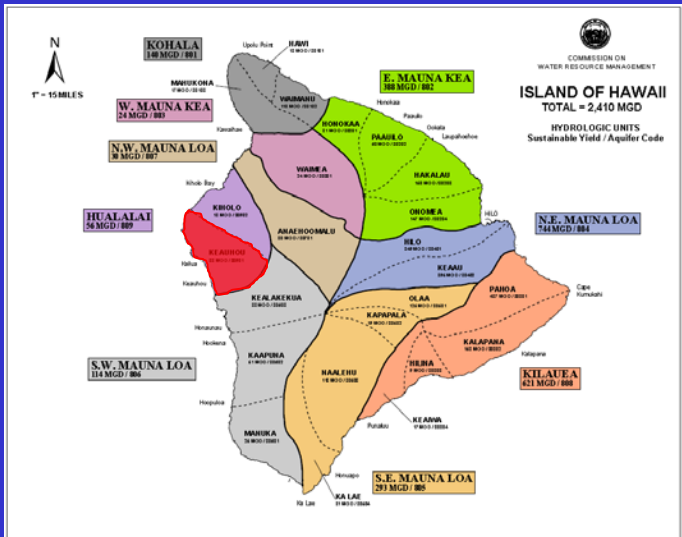


U.S. Department of Interior National Park Service Kaloko-Honokōhau National Historical Park Petition for Ground Water Management Area Designation Keauhou Aquifer System Area, North Kona, Hawaii



U.S. Department of Interior National Park Service Kaloko-Honokōhau National Historical Park Petition for Ground Water Management Area Designation Keauhou Aquifer System Area, North Kona, Hawaii

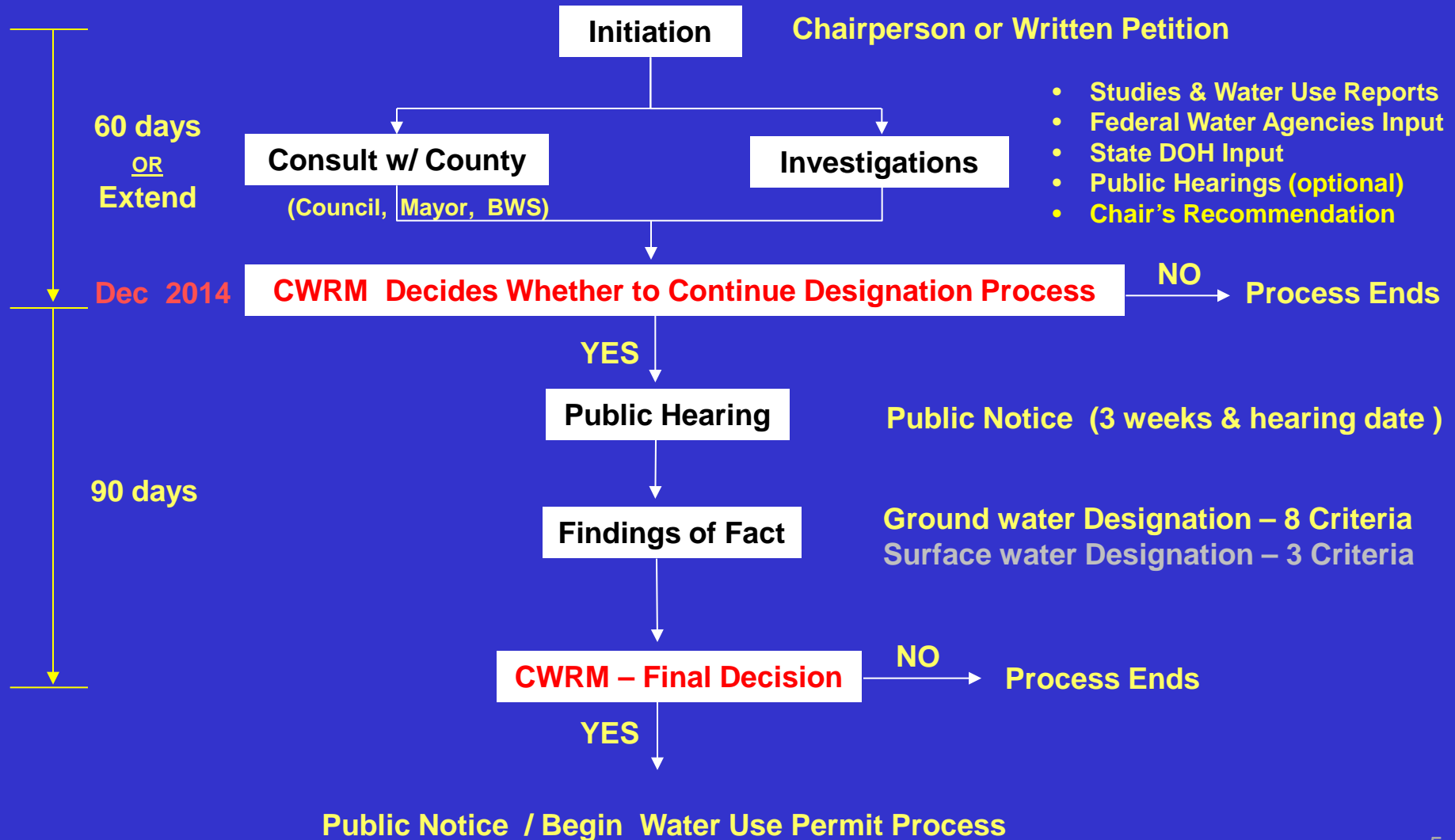


On September 13, 2013, the National Park Service at the Kaloko-Honokōhau National Historical Park submitted a petition to the Commission requesting that the Keauhou Aquifer System Area be designated as a Ground Water Management Area.

Ground Water Management Areas require additional regulation through Commission-approved ground water use permits.

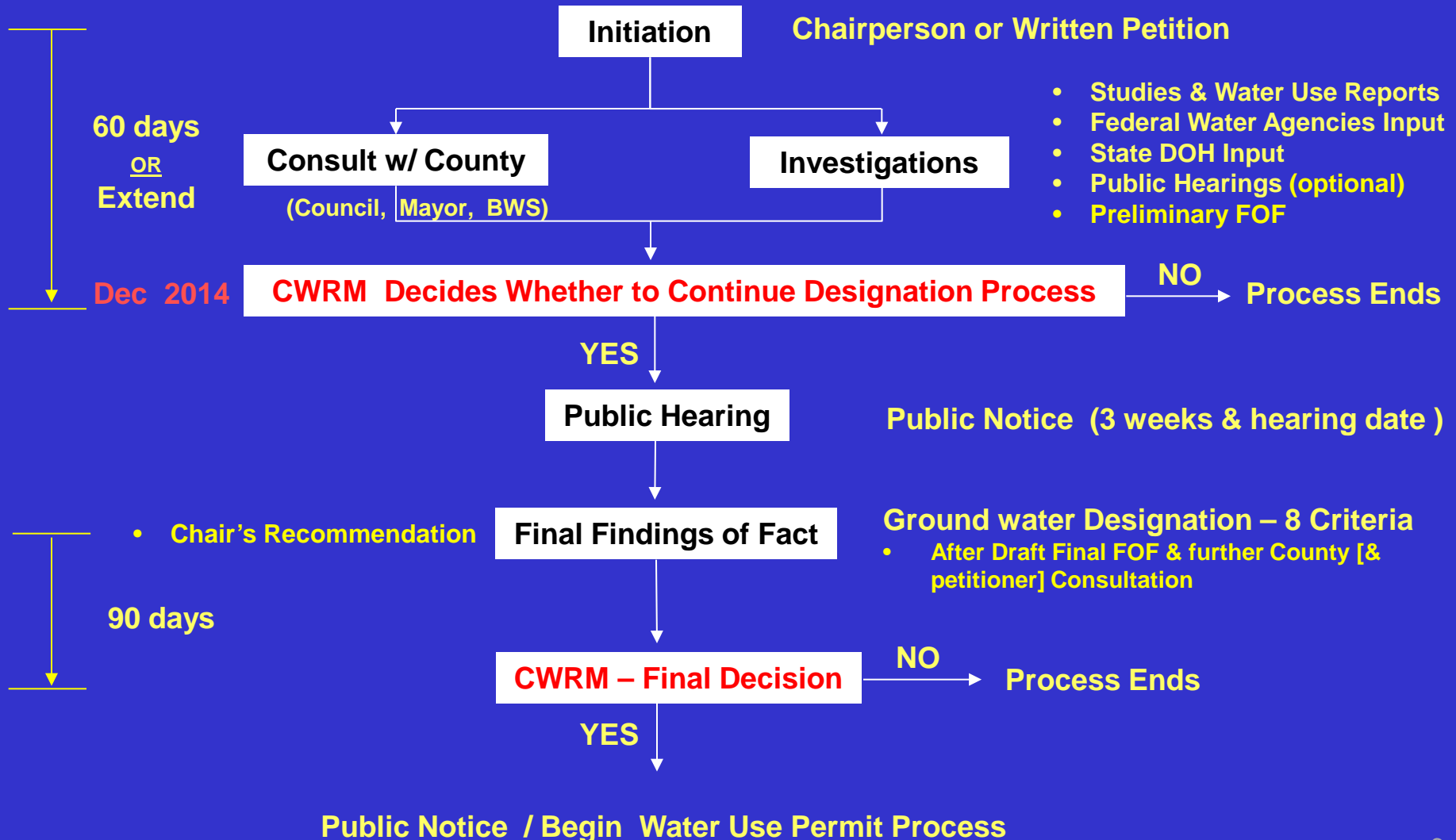
Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



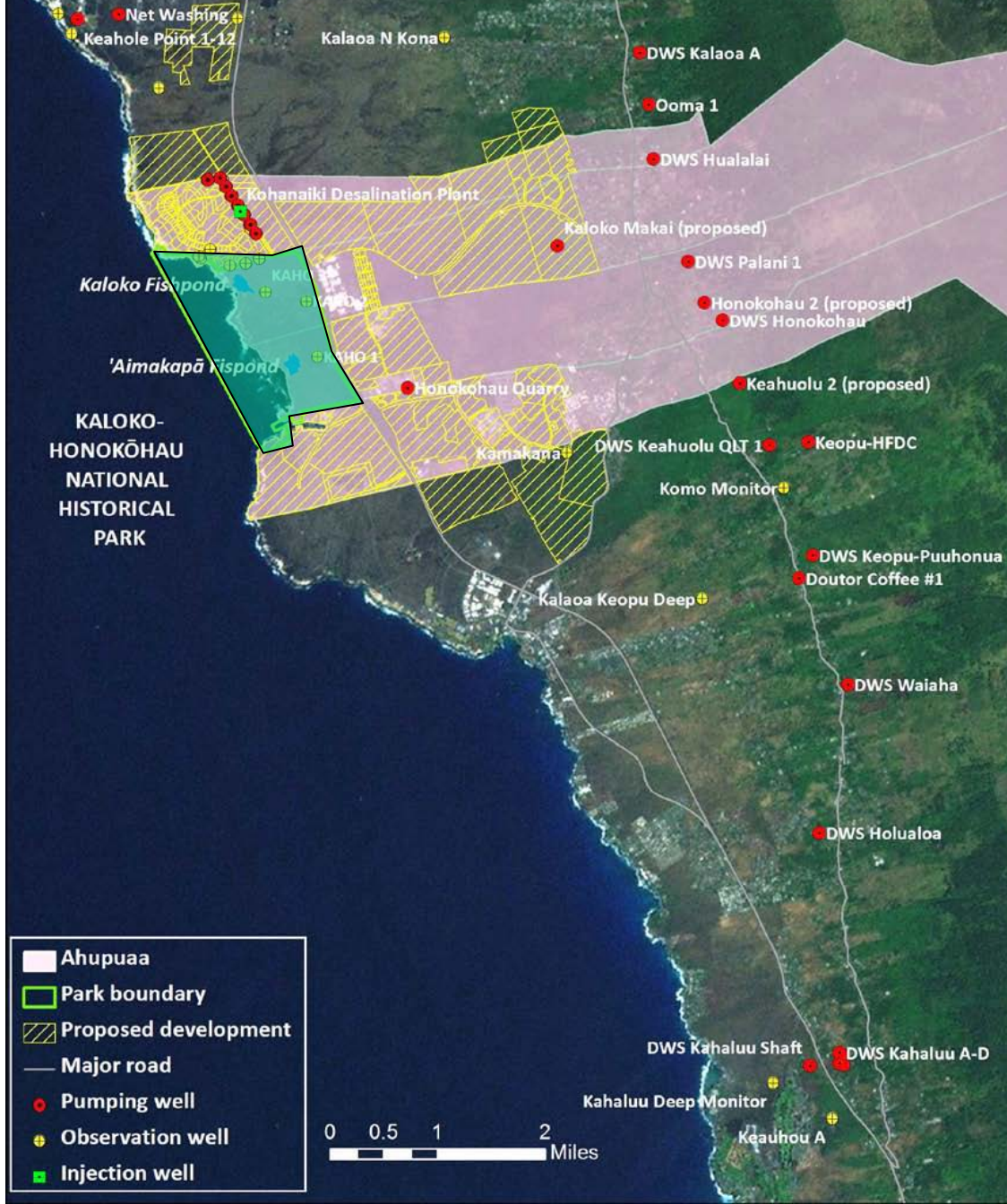
Designation Process

(HRS 174C-41 to 46, HAR 13-171-3 to 9)



Kaloko-Honokōhau





Significant collaboration since 2007:

- Working group (NPS)
- Round Table (HDWS)
- Professionals Group – 2008 WRPP (CWRM)

Outcomes of these collaborations:

- **Increased monitoring** (increase to quarterly monitoring, 2013 online water use reporting, additional monitor wells: Komo, Kainaliu, Kamakana, Keopu, Kohanaiki, etc.)
- **Current ongoing studies** (WRPP, Evapotranspiration, Recharge, & data trends updates; USGS-High-Level/Basal Isotope Study & 3D Numerical Model)
- **Extensive bibliographies of completed studies** (2011 Big Island Recharge, 2012 Rainfall Atlas, NELHA, NPS, others)

Ground Water Criteria Commission shall consider (§174C-44):

- (1) Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach 90% of the sustainable yield;
- (2) There is an actual or threatened water quality degradation as determined by DOH;
- (3) Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels;
- (4) Whether the rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water;

Ground Water Criteria Commission shall consider (§174C-44):

- (5) Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;
- (6) Excessive preventable waste of ground water is occurring;
- (7) Serious disputes respecting the use of ground water; or
- (8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.

2013 Petition from National Parks Service to designate the Keauhou Aquifer System Area (KASA)

5 of 8 criteria the Commission shall consider were raised:

- Sustainable Yield approach to groundwater management is not adequate to address 1) potential harm to the biota and potential for limiting the practice of Traditional and Customary Rights caused by the reduction of shoreline discharge from pumping, 2) projected water demands that exceed SY, or 3) rising sea-level and declining rainfall
- Documented Saltwater Encroachment: Kahaluu Area
- Waste: Kona water use is “2.5 higher than other areas of the county”
- Serious Disputes: 1) effects of cumulative future pumping on NPS resources, 2) conceptual models of the hydrogeologic structure of the KASA
- Potential development projects will contribute to cumulative withdrawals that will exceed the KASA sustainable yield



COMMISSION ON
WATER RESOURCE MANAGEMENT

ISLAND OF HAWAII

TOTAL = 2,410 MGD

HYDROLOGIC UNITS
Sustainable Yield / Aquifer Code

N
1" = 15 MILES

KOHALA
140 MGD / 801

Upolu Point
HAWI
18 MGD / 80101

E. MAUNA KEA
388 MGD / 802

MAHUKONA
17 MGD / 80103

WAIMANU
110 MGD / 80102

Honokaa

W. MAUNA KEA
24 MGD / 803

HONOKAA
31 MGD / 80201

Paaulo

N.W. MAUNA LOA
30 MGD / 807

PAAUILO
80 MGD / 80202

Ookala

Laupahoehoe

Kawaihae

WAMEA
24 MGD / 80301

HAKALAU
160 MGD / 80203

Kiholo Bay

HUALALAI
56 MGD / 809

KIHOLO
18 MGD / 80902

ANAEHOOMALU
30 MGD / 80701

ONOMEA
147 MGD / 80204

HILO

N.E. MAUNA LOA
744 MGD / 804

2015 WRPP SY
Range = 38 to 80 mgd

KEAUHOU
38 MGD / 80901

Kailua

Keauhou

HILO
348 MGD / 80401

KEAAU
386 MGD / 80402

KEALAKEKUA
38 MGD / 80903

OLAA
126 MGD / 80601

PAHOA
457 MGD / 80801

Cape Kumukahi

2015 WRPP Recharge
Range = 87 to 183 mgd

Coastal Discharge
Range = 49 to 145 mgd

Ii

Ena

KAAPUNA
61 MGD / 80802

KAPAPALA
18 MGD / 80602

KALAPANA
168 MGD / 80802

Kalapana

KILAUEA
621 MGD / 808

loopuloa

MANUKA
26 MGD / 80801

NAALEHU
118 MGD / 80603

HILINA
8 MGD / 80803

KEAIWA
17 MGD / 80804

S.E. MAUNA LOA
293 MGD / 805

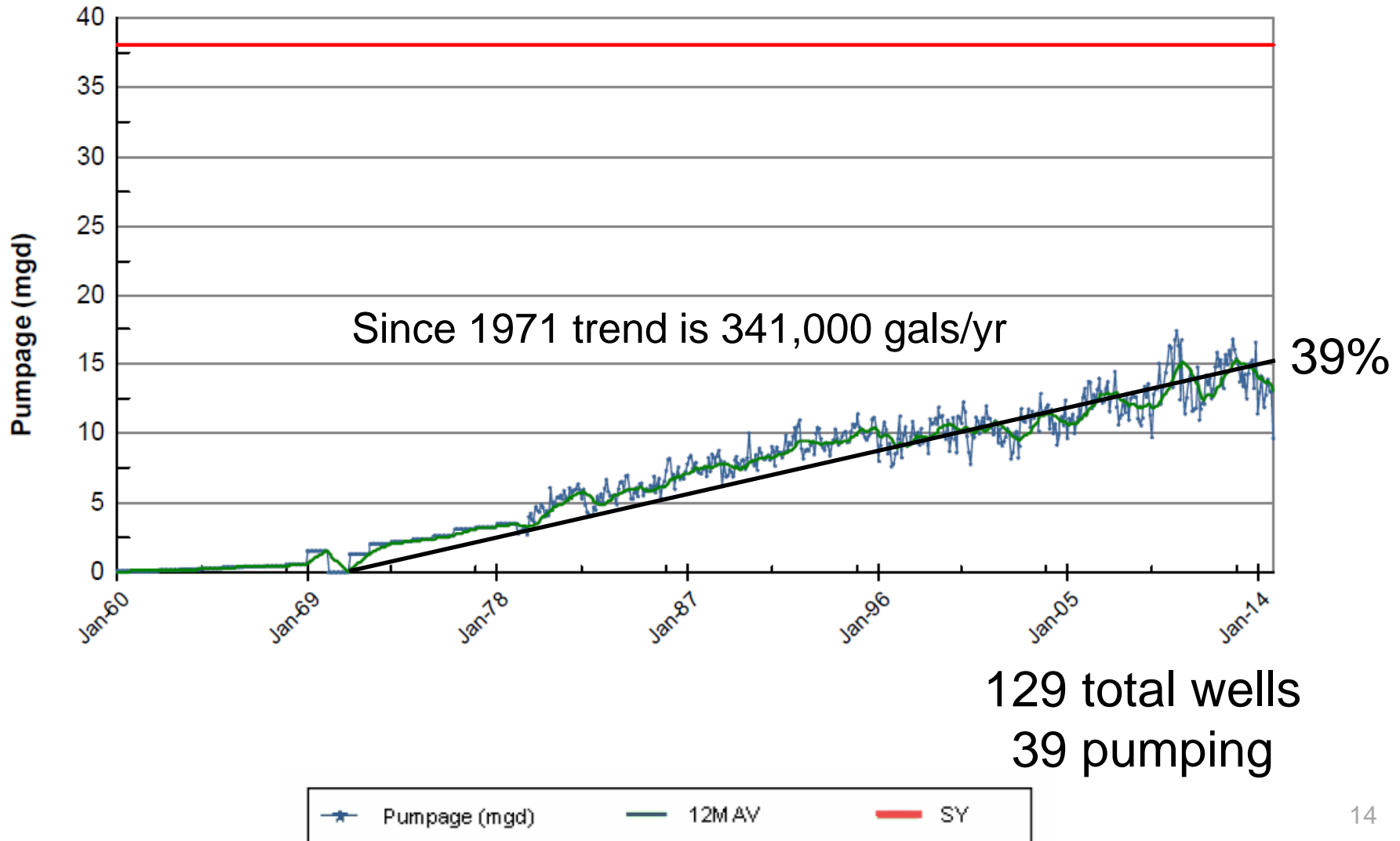
Honuapo

KA LAE
31 MGD / 80604

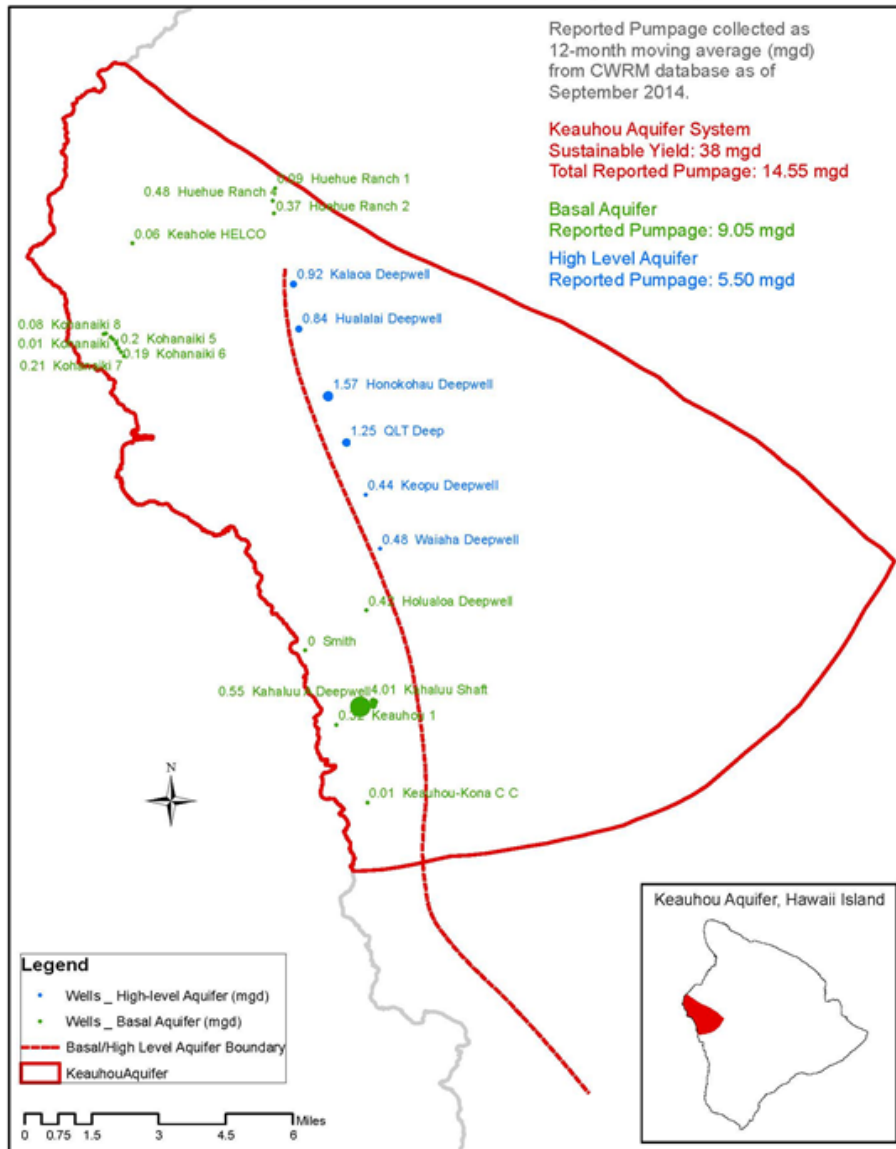
Ka Lae

Monthly Pumpage Chart

12 Month Moving Average



Reported Pumpage from Keauhou Aquifer System Area

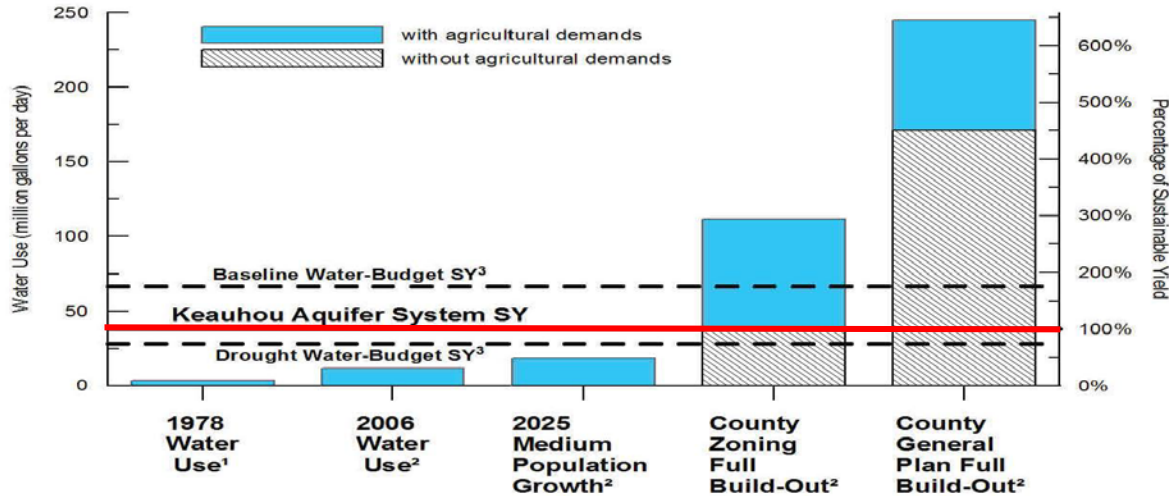


15 mgd KASA

9 mgd Basal

6 mgd High Level

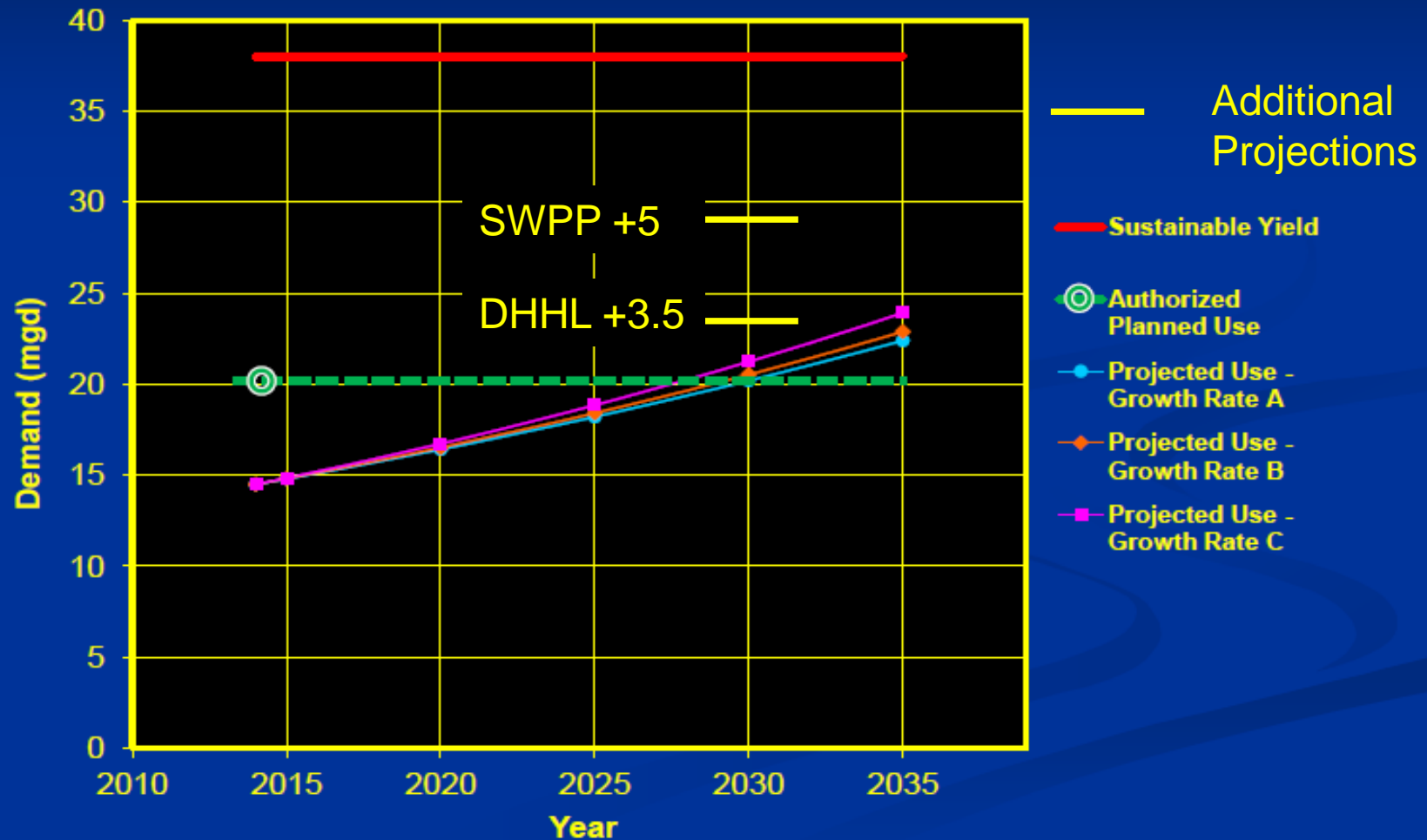
FOF Figure 3. Map showing Keauhou Aquifer System Area with high-level pumping wells and



§174C-41 Designation of water management area. (a) When it can be reasonably determined, after conducting scientific investigations and research, that the water resources in an area may be threatened by existing or proposed withdrawals or diversions of water, the commission shall designate the area for the purpose of establishing administrative control over the withdrawals and diversions of ground and surface waters in the area to ensure reasonable-beneficial use of the water resources in the public interest.

Pumpage of 175 Mgal/d will serve > 1 million people.

Keauhou Aquifer System Area Projected Demands



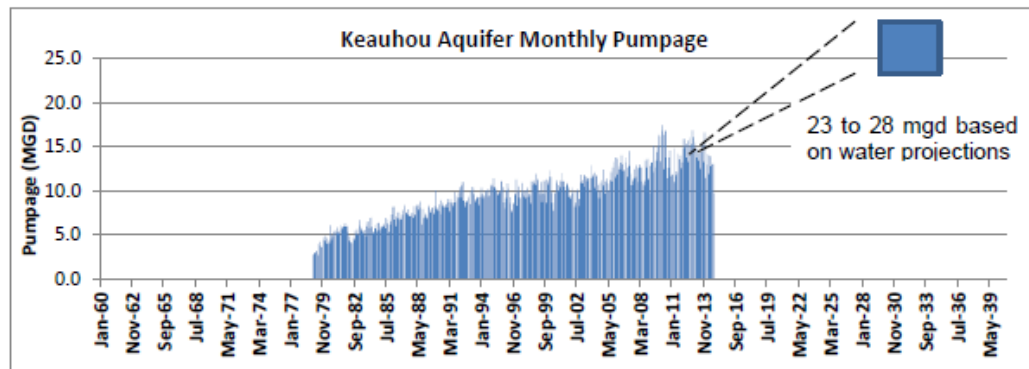
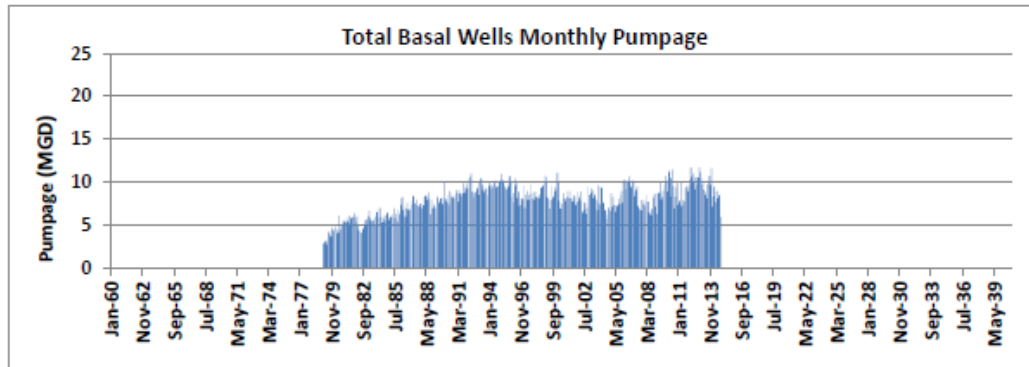
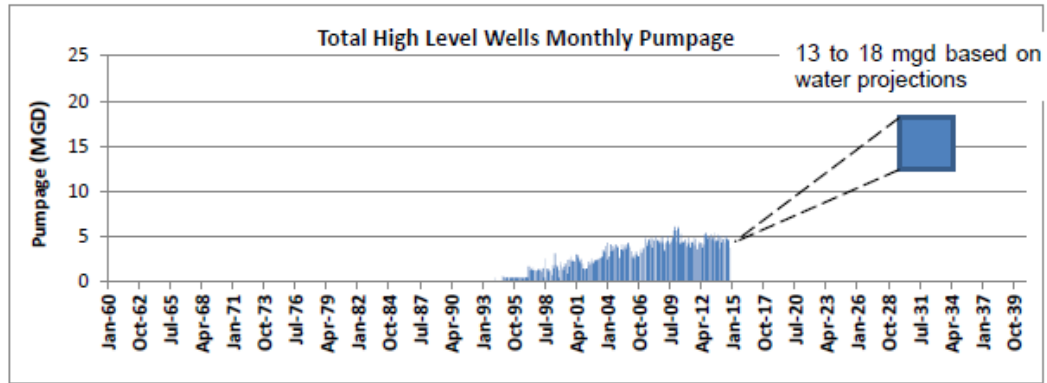
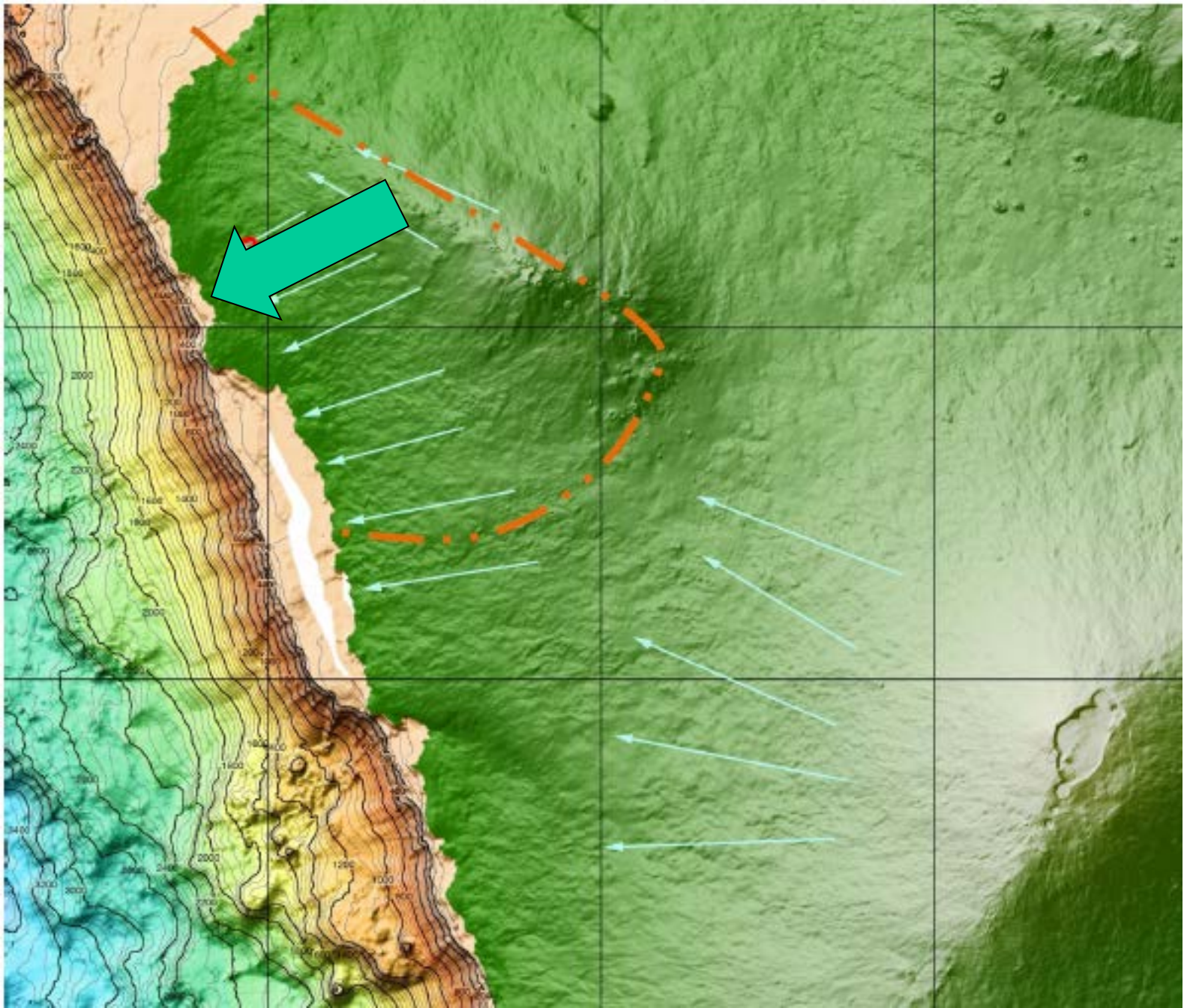


Figure 18. Annual Keauhou Aquifer System Area pumpage; high-level, basal, and total, with projection for the year 2030







Local R = 47 mgd

Local R = 8 mgd

Isotope Study = 30% of total Q

